

Montana Weather, Water and Climate Summary

Summer 2017

WATER POLICY INTERIM
COMMITTEE 2017-18

October 9, 2017

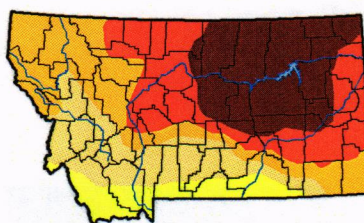
Exhibit 10

Summer 2017 Drought Conditions

Beginning in April 2017 and continuing through September 2017, dry, windy conditions and above normal temperatures led to a rapid decrease in soil moisture and curing of live fuels. This short period of above normal temperatures, negligible precipitation, anomalously low and rapid decreasing soil moisture is referred to as a flash drought. The drought initially impacted northeastern Montana, then spread statewide as continued dry and very warm conditions prevailed. The worst drought conditions were across northeast Montana where significant and devastating impacts as a result of this drought occurred. All of Montana has experienced some level of drought with over 70 percent of Montana in severe, extreme or exceptional drought at the peak in early September. In addition, drought has impacted nearly all of Montana in a variety of ways from agriculture to recreation/tourism, fisheries/wildlife, water supply and power/mining/energy.

The timing of these conditions greatly contributed to the severity and impact of this drought. May and June are climatologically our wettest months of the year for much of Montana and this is a critical time period for the agriculture community and the growing season. The northeast Montana climate division for the time period of May and June 2017, as well as the time period May through August 2017 ranked the driest in recorded history. May through August 2017 also ranked the driest in recorded history for the north-central Montana climate division. The State of Montana ranked 2nd driest for precipitation between May 2017 and August 2017.

U.S. Drought Monitor Montana



September 12, 2017
(Released Thursday, Sep. 14, 2017)
Valid 6 a.m. EDT

	None	D0-D1	D1-D2	D2-D3	D3-D4	D4
Current	0.00	100.00	91.22	73.02	49.86	25.97
Last Week 08-26-2017	0.00	100.00	91.22	68.77	43.66	25.97
3 Months Ago 06-10-2017	64.27	35.73	20.85	10.02	0.00	0.00
Start of Calendar Year 01-01-2017	74.25	25.75	4.87	0.00	0.00	0.00
Start of Water Year 09-01-2016	55.14	44.86	25.49	6.96	0.33	0.00
One Year Ago 09-12-2016	54.61	45.39	20.91	6.96	0.35	0.00

Intensity:
 D0 Abnormally Dry D3 Extreme Drought
 D1 Moderate Drought D4 Exceptional Drought
 D2 Severe Drought
 The Drought Monitor focuses on broad-scale conditions.
 Local conditions may vary. See accompanying text summary
 for forecast statements.

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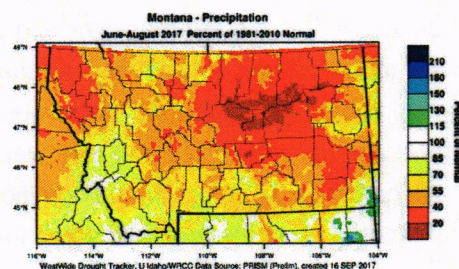
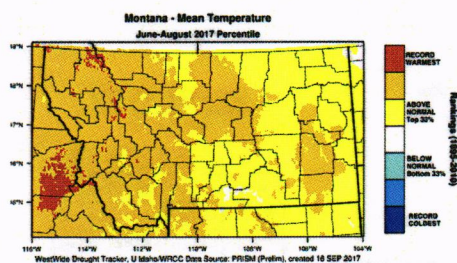
PERIOD	PRECIP	20 TH CENTURY AVERAGE	DEPARTURE	RANK	WETTEST/DRIEST SINCE	RECORD
May - Aug 2017 4-month period	4.10" (104.14 mm)	8.18" (207.77 mm)	-4.08" (-103.63 mm)	2 nd Driest 122 nd Wettest	Driest since: 1919 Wettest since: 2016	1919 1993

In addition to drought, the rapid onset of very dry and hot conditions in the late Spring through Summer led to rapidly increasing fire danger with critically low fuel moisture levels. In fact, many areas this season have experienced fuel moisture levels at or near-record levels for severity. Furthermore, numerous lightning strikes and strong winds from dry thunderstorms caused wildfires with erratic fire behavior and rapid fire growth across Montana. Over 1.4 million acres have burned as of 27 September 2017.

Check out the [National Drought Mitigation Center's Drought and Climate for August 2017 Report](#) to learn more about drought in Montana and the rest of the country.

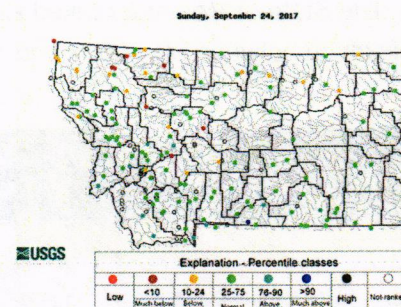
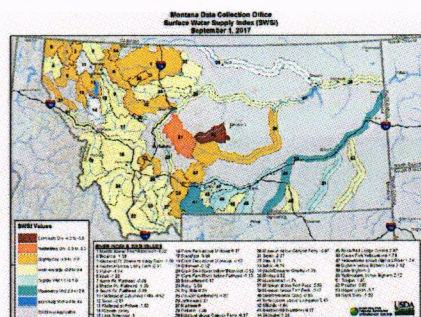
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Summer 2017 precipitation was overwhelmingly below average for virtually the entire state of Montana. Much of the state saw only 20-40% of normal precipitation for the months of June, July, and August, with some locations in eastern Montana receiving less than 20%.



Temperatures across the state of Montana have almost exclusively been above normal this summer. Most of the state was in the top 33% of temperatures for the months of June, July, and August. There are pockets in Western Montana that were record warmest for those months.

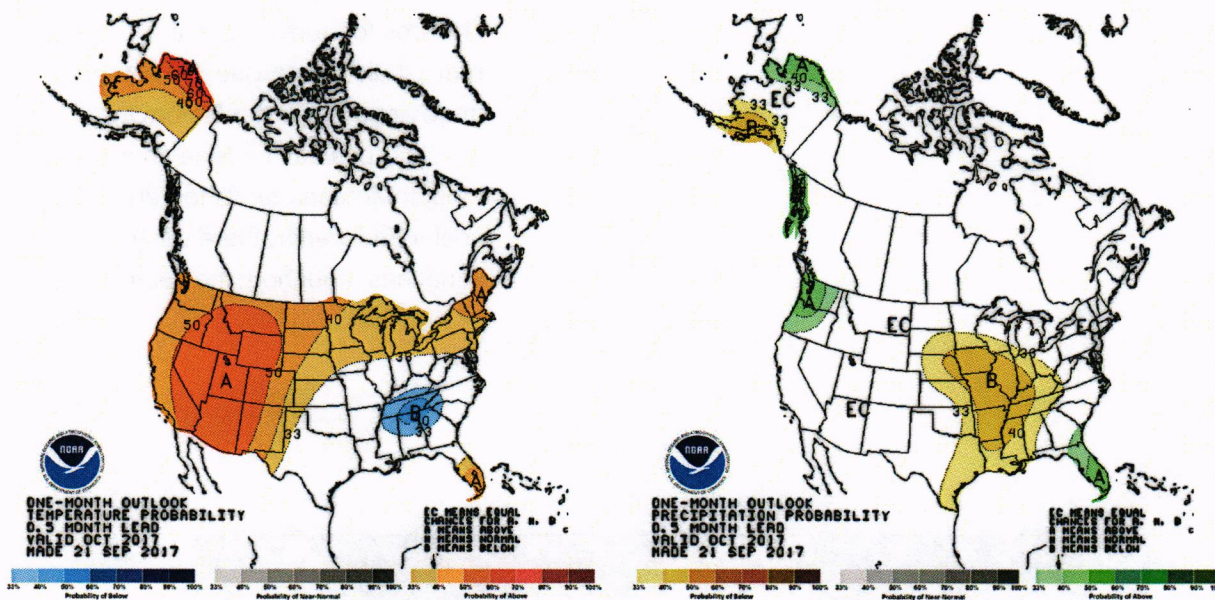
Water Resources



Hydrologically, the state is mostly below normal compared to previous years across the major river basins as shown by the Surface Water Supply Index (SWSI) which takes into account mountain snowpack, precipitation, streamflow, reservoir contents, and soil moisture conditions. While many of the state's reservoirs have normal to above normal storage due to a good snowpack last winter, precipitation and soil moisture have been extremely low leading to most basins categorized as below normal. The greater Yellowstone River basin is the one exception due to a 2016/2017 snowpack that was well above average as well as Southern Montana seeing more precipitation than the rest of the state. Streamflow at USGS gages is fairing better in certain areas of the state. However, there are still many gages reporting below normal to record low streamflow for the date. For up to date streamflow conditions, visit the [USGS Montana-Wyoming Water Science Center Realtime Streamflow Page](#). Since Montana includes the headwaters of the Missouri River basin, our local drought conditions have the potential to affect water supply across a large swath of the middle part of the country. For more information on the state of the greater Missouri River Basin, check out the [Missouri River Basin Quarterly Climate Impacts and Outlook](#) newsletter.

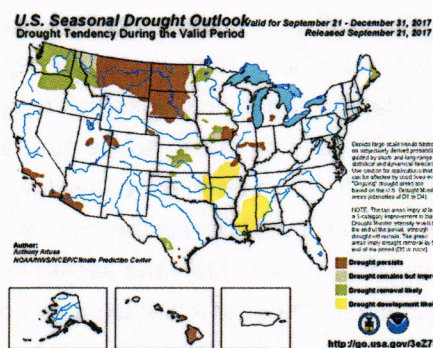
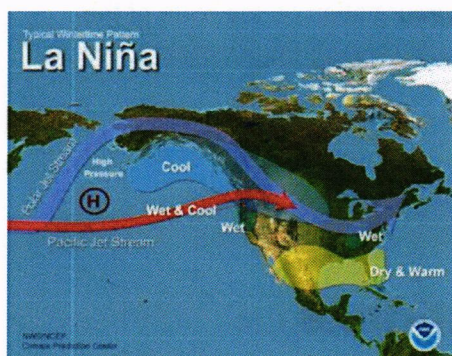
Weather and Climate Outlooks

For October, the climate outlook has better chances for above normal temperatures statewide and equal chances of above, normal, or below average temperatures for the majority of the state.



U.S. Seasonal Drought Outlook

Given the anticipated La Nina, the U.S. Seasonal Drought Outlook through 31 December 2017 suggests drought persisting along and east of the Continental Divide with drought improvement or removal west of the Continental Divide.



La Nina Watch!

There is an increasing chance that sea-surface temperatures in the eastern equatorial Pacific Ocean will be below normal this Fall and Winter, which is known as a La Nina. A typical winter pattern for Montana under La Nina conditions is typically wet and cool. Given the expected La Nina conditions, the climate outlook for December-January-February has equal chances for above, below or near normal temperatures and better chances for above normal precipitation statewide. However, there are many other factors to consider besides La Nina so even though Montana tends to trend cooler and wetter, there will be variations throughout the seasons.

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